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*A Magazine of Popular Science for the Lecture-Room and the Domestic Circle.*

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EDITED BY J. HAY TAYLOR.

Vol. 8.—No. 96. MAY, 1897. [Entered at Stationers' Hall.]
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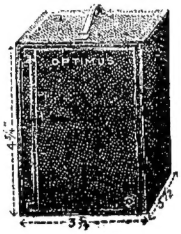

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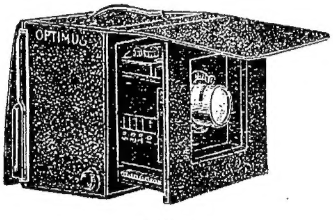

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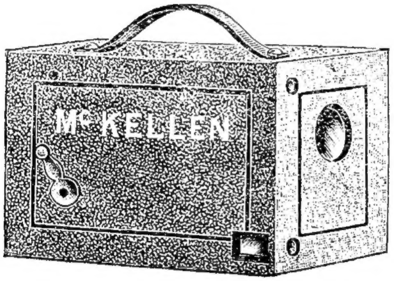

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THE
OPTICAL
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## NOTICES.

THE *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price Two Pence, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

12 months, 2/6. United States, 75 cents.

EXCHANGE Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

**SMALL ADVERTISEMENTS** must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

**EDITORIAL** communications must be addressed, J. HAY TAYLOR. Advertisements and business communications to the **Magic Lantern Journal Company, Limited, 9, Carthusian Street, London, E.C.**

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.

## NOTES.

**Stevens Bros.' Business.**—The business of Stevens Bros., the makers of slides of a religious order, in Glasgow, has been taken over by Mr. Lizars of the same town.

◆ ◆ ◆

**Indian Famine Fund.**—On the 2nd ult. a lantern exhibition was given in the Masonic Hall, Gourock, by Bro. W. Robertson (Lodge 626), in aid of the Indian Famine Fund.

◆ ◆ ◆

**Supply of Calcium Carbide.**—We are informed by the Acetylene Gas Company, of Putney, that they are now able to supply any quantity of calcium carbide at £28 per ton, or £2 2s. per cwt.

◆ ◆ ◆

**Storing Acetylene.**—The latest suggestion in connection with the storing of acetylene is to dissolve the gas in acetone, which, at normal pressure, will absorb about thirty times its own volume of acetylene. Its dissolving powers are greatly increased by adjusting the pressure.

◆ ◆ ◆

**Theatrical Lighting.**—In connection with stage illumination, Mr. F. J. Borland, of Leeds has, during the past three years, introduced several novelties, and his electric lamps are to be found in many of the London and provincial theatres.

◆ ◆ ◆

**Sausages from Dogs and Cats.**—A very humorous set of animated photographs has recently been made in New York. A man is seen turning the handle of a huge sausage machine, from the spout of which sausages are pouring out. During the operation several men come on the scene, and drop small dogs and cats into the large hopper. These run through an opening behind and can be used over and over again.

◆ ◆ ◆

**Skeleton Slides.**—Messrs. Newton and Co. have made lantern slides of a boy of 14 years of age showing the whole skeleton by X rays. This firm report business as being brisk, and they have had to take and fit up extra workshops in order to afford room for their men.

◆ ◆ ◆

**"Photographic Life."**—During the past three months we have noted with interest the growth of the latest photo-weekly. *Photographic Life* grew out of the ashes of the *Photographic Review*, and is ably conducted by Mr. Walter D. Welford, of 19, Southampton Buildings, Chancery Lane, W.C. Prize competitions and a ladies' column are among the new features introduced in this paper.

◆ ◆ ◆

**Oxygen Generator.** — We learn that a generator invented by Mr. Suiter has been taken over by a syndicate, with offices at 96, Leadenhall Street, E.C. A limited company has been formed, and shares are now offered to the public. Not having had an opportunity afforded us of seeing or trying this apparatus, we are unable to speak of any merits it may possess.

◆ ◆ ◆

**Negative Examiner and Camera Obscura combined.**—A new device for examining negatives or lantern slides has been invented by Mr. W. A. Eddy, of Bayonne, N.J., U.S.A. It can also be employed as a camera obscura. A reflector box is made with an apertured rear wall and inclined apertured support at its front end, a mirror at the bottom throwing the light entering through the rear aperture on an article placed on the support. A stationary closed section, on which slides an outwardly movable sight section, extends up in front of the inclined support. The article on the support may be illuminated in two ways, either directly or by reflection by the mirror, the light falling on the article being regulated as desired in either case.

**Cinematographist.**—Time was when the person who presided at the lantern at a lime-light entertainment was spoken of as the lantern operator, but it appears that a new appellation is now applied to this individual when animated photographs form a part of the entertainment. A certain well-known lantern operator had occasion lately to fill in a form when effecting a life insurance. Under the heading of "Occupation," he wrote the word cinematographist. The word was evidently not understood at the Insurance Company's head-quarters, and it had eventually to be altered to "photographer and lanternist."

◆ ◆ ◆

**Testimonials re Animated Photographs.**—"Every eye sees its own beauty." Two young men recently began a tour with a few very indifferent cinematographic films. When they were exhibited in a large town the report in a certain paper described them as "blurred, streaky, and uninteresting," whereas, when the same pictures were exhibited at the village of ————, the local paper said they were "highly artistic, clearly defined, and of such great interest that they fairly brought down the house." The second testimonial will probably be printed on the prospectus, but the first will be left to die a natural death.

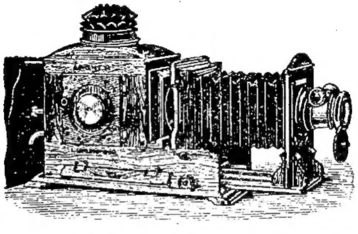
## *Explosion of an Acetylene Gas Generator at Hampstead.*

MY experience of acetylene gas, writes Mr. Henry E. Miller, of Hampstead, may be a warning to some of the readers of this journal.

"For some time I have used an 'Incanto' generator, at first in-doors, but subsequently (on account of the smell) out of doors, with a long rubber tube to my lantern. I have always found that at intervals the gas will force its way out of the water and escape into the air, no matter how carefully the calcium carbide is broken up; but I was not prepared for what happened on the last occasion of my using the apparatus.

Having to do some enlarging, I put the generator outside the house, and having got the lantern ready, proceeded as usual with the manufacture of the gas. In order not to have the mixture of gas and air passing into the room through the burner, I disconnected the tube from the gas outlet, and applied a match

# ARCHER'S IMPROVED OPTICAL LANTERNS.



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The Improved "PHOTINUS" is the most powerful oil lantern in the world. Price **£4 4s.**

The Best "BLO-THRO" SAFETY JET in the Market. 500 Candle power Price only **16s.** Send for List, Post Free.

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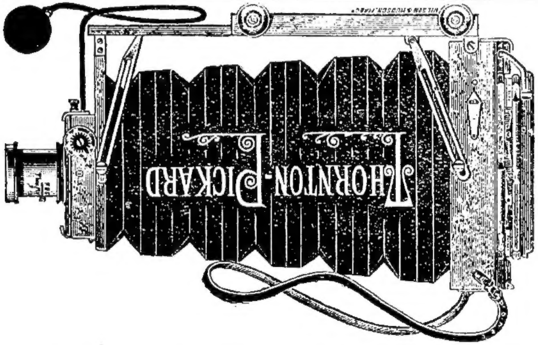

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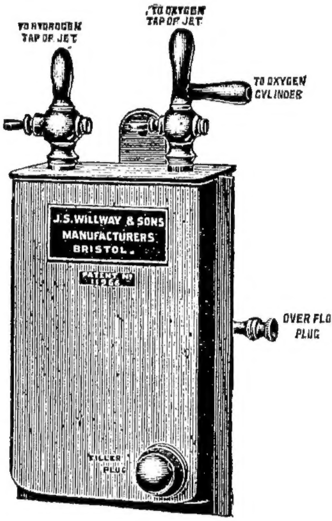
TO HYDROGEN TAP OF JET
TO OXYGEN TAP OF JET
TO OXYGEN CYLINDER
J. S. WILLWAY & SONS MANUFACTURERS BRISTOL.
PATENT No 11966
OVER FLOW PLUG
FILLER PLUG

ABSOLUTE SAFETY.

No. 1.—For Jets consuming up to 3½ cubic feet per hour.

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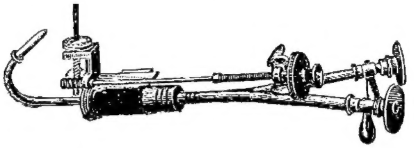

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BEFORE PURCHASING ELSEWHERE SEND FOR PARTICULARS OF
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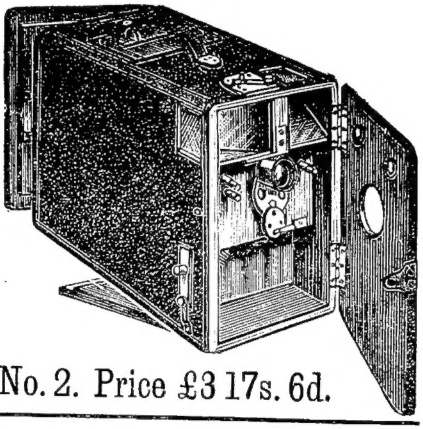

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Patent 24761/93. **Price 30s.**

This is the only perfect Mixed Jet which can be worked with coal-gas taken direct from the town supply, and oxygen at high pressure from a cylinder. It combines the full efficiency of a mixed jet with the safety, economy and convenience of a blow-through. Blow-through jets are quite superseded by it. An ordinary mixed jet which will produce any given candle-power when supplied with both gases under pressure will, when fitted with our Injector, give the same Power when taking its coal-gas supply from the house service-pipe. When required the jet can be worked with both gases taken from cylinders just as an ordinary mixed jet.

*All further particulars from—*

**The MANCHESTER OXYGEN (BRIN'S PATENT) Co., Ltd., Gt. Marlborough St., MANCHESTER.**

**BRIN'S OXYGEN.**

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**OXYGEN of Guaranteed Purity supplied in Cylinders of the Best BRITISH Manufacture, and complying with all the established Trade and Railway Regulations**

The public are respectfully informed that all Cylinders which are filled by the Brin Companies (whether their own or their Customers) are labelled with the Companies' Trade Mark. This label guarantees the purity of the Gas, and is a further guarantee that the Cylinder has been tested and proved sound in every respect by the Brin Company which has filled it. Customers who wish to procure Brin's Oxygen are requested to see that the Cylinders supplied to them bear this label, which is also stamped with the date on which the Cylinder was filled.

The Works of the Brin Companies are open during business hours to the inspection of their Customers, who are at liberty to test the quality of Gas being manufactured, and to watch their own Cylinders being tested and filled.

Registered Trade Mark.

*Price Lists of Gases, Cylinders, and all Accessories, can be obtained from the Company's accredited Agents, or will be sent Post free on application.*

*Addresses*—
BRIN'S OXYGEN COMPANY, Limited, 34, Victoria Street, WESTMINSTER, S.W.
Works—69, Horseferry Road, WESTMINSTER, S.W.
MANCHESTER OXYGEN COMPANY, Limited, Great Marlborough Street, MANCHESTER
BIRMINGHAM OXYGEN COMPANY, Limited, Saltley Works, BIRMINGHAM.

to the orifice of the gas tap, expecting that if all the air had been expelled the gas would light, and if not, that it would fizzle. However, the moment I applied the light a tremendous explosion followed, as loud as the discharge of a heavy piece of ordnance, and the generator was blown into fragments. My own escape was miraculous, for I was standing with my face close to the top of the generator, but I received only a cut on the lip, the force of the explosion being away from where I was standing. As the end of the gas outlet is at least two feet from where the gas enters the tube inside the generator, I do not see how applying a light at the orifice could fire the gas inside the generator, unless acetylene gas has more dangerous characteristics than any other lighting gas. Perhaps some of the readers of this journal can throw some light upon the accident ?"

After reading this, we feel that we must again emphasise one or two points that we have several times tried to impress upon users of generators. One is that when once the calcium carbide has become wet it will, in spite of having been withdrawn from the water, continue to slowly give off a quantity of gas, and if this be not used up, and the bell container be small, it will become filled with gas and the overflow will bubble up through the water. The remedy for this is a larger container. Another point is to keep a light away from the generator.

**The cause of the explosion**

is not far to seek; given an explosive mixture of gas coming from a pipe of large diameter with little or no pressure of gas behind it, we have the very best conditions for a blow-up if a light is applied. If under these conditions, pressure had been applied on the gasometer, it is possible that the flame would have remained and burned at the outlet. It must be remembered that in the generator spoken of, it is only the weight of the bell tank which gives pressure to the gas, which pressure is ample when the gas is used at the extremely small orifice of the burner with which it is intended to be employed. Even under the conditions spoken of by Mr. Miller, had he reduced the outlet pipe (say, by inserting a burner in it) the pressure would then have been ample to prevent firing back, and until the proportion of air in the gasometer had been reduced, the holding of a lighted match at the burner would merely have blown the flame out. At the next stage, or when the proportion of air became diminished, the mixture would burn with a faint bluish light, which would gradually become brighter as the air became expelled, when the acetylene would give its utmost brilliancy.

We must congratulate Mr. Miller on his miraculous escape, and hope that the above few hints will assist him and other readers to a better understanding of the working of a gas generator. At the same time, we consider that the instructions sent out with acetylene generators are far from sufficient to put a beginner on his guard as to what might happen under certain circumstances.

During some experiments several months ago, we showed that by allowing air to bubble up through the water used in a generator, which water was impregnated with acetylene gas, even this when collected in a jar would burn.

## *Carbide of Calcium.*

### LONDON COUNTY COUNCIL.—PUBLIC CONTROL DEPARTMENT.

Abstract of the Regulations as to the Keeping, Sale, and Conveyance of Carbide of Calcium in the Metropolis.

This Abstract has no legal validity, and is intended only for the information and guidance of the persons concerned. For further information reference should be made to the Petroleum Acts, and to the Order in Council dated 26th February, 1897.

General.

1. By an order in Council, dated 26th February, 1897, Carbide of Calcium can only be kept in pursuance of a license granted by the local authority.

2. No exemptions from this provision are made, so that a license is necessary for the keeping of any quantity of the Carbide, whether for sale or private use.

3. Where Carbide of Calcium is—
   (*a*) Kept at any place; or
   (*b*) Sold or exposed for sale,

the vessel containing it shall bear a label stating in conspicuous characters, the words, "Carbide of Calcium," "Dangerous if not kept dry," and with the following caution:—"The contents of this package are liable if brought into contact with moisture to give off a highly inflammable gas," and also the name and address of the owner or vendor.

Licenses.

4. Application to the Council for a license to keep Carbide of Calcium at any place in the County of London (except the City of London) must be made upon the form provided for the purpose, which can be obtained by application in writing, addressed to the Chief Officer, Public Control Department of the London County Council, 21, Whitehall-place, S.W.

5. Every application must be accompanied by a fee of 5s. in money, or, if sent through the post, by cheque or postal order for that amount payable to the order of the London County Council. The fee will be returned to the applicant if the license be not granted.

6. Every application must state—
- (*a*) The quantity of Carbide of Calcium which the applicant desires to keep;
- (*b*) The proposed place and method of storage;
- (*c*) If the Carbide is only to be kept for sale in closed vessels, or if it is to be used in the manufacture of Acetylene Gas.

7. Carbide of Calcium should be kept in strong metal vessels, and—
- (*a*) Such vessels should be so constructed and closed as to prevent the admission of water or atmospheric moisture.
- (*b*) Such vessels should only be opened for the time necessary for the removal of any required quantity of Carbide, or for the refilling of the vessels.
- (*c*) No one vessel should have a greater capacity than necessary for containing 112 lbs. of Carbide.
- (*d*) Every vessel of a greater capacity than 2 lbs. should be provided with a lock or be placed in a locked receptacle so as to prevent unauthorised persons gaining access to the contents.
- (*e*) Copper should not be used in the construction of vessels for containing Carbide.

8. Vessels containing Carbide of Calcium should not be kept in dwelling-houses, but in dry and well-ventilated outbuildings.

9. Small quantities for sale or immediate use will be allowed in shops, dwellings or workshops, if the arrangements are satisfactory.

10. The Council proposes only to grant licenses to keep Carbide of Calcium which is pure (in a commercial sense), *i.e.*, which contains no impurities liable to generate phosphoretted or siliciuretted hydrogen so as to render the gas evolved liable to ignite spontaneously.

11. Where Carbide of Calcium is kept for the manufacture of Acetylene Gas, it is desirable that such of the following precautions for ensuring safety as are applicable to the circumstances, should be adopted—
- (*a*) Every apparatus for generating and storing Acetylene Gas should be placed in an outbuilding. (This does not apply to portable apparatus holding a charge of less than 2 lbs. of Carbide.)
- (*b*) Such building should be separated as far as may be practicable from inhabited buildings, and should be well ventilated.
- (*c*) No fire or such artificial light as would ignite inflammable gas should be taken into or near the building or place where a gas-making apparatus is situate.

12. Every apparatus (including generator and gas holder) used for Acetylene Gas should as far as practicable be constructed and used so as to provide against the special risk, *i.e.*—
- (*a*) Copper should not be used in any part of the apparatus.
- (*b*) The various parts should be of adequate strength.
- (*c*) Escape of gas from the apparatus should be carefully guarded against.
- (*d*) Satisfactory provision should be made against dangerous development of heat.
- (*e*) Satisfactory provision should be made against undue pressure by the employment of an adequate safety valve connected with a pipe discharging into the open air, and a suitable pressure gauge should be attached to the apparatus.
- (*f*) Provision should be made for the residue of the Carbide being mixed with at least ten times its bulk of water on being removed from the apparatus.
- (*g*) No person should have charge of an apparatus until he has been properly instructed in its management.

13. Licenses are granted for keeping Carbide of Calcium for periods not exceeding one year, and prior to expiration application must be made for their renewal. Notice of the expiration, and a form of application for renewal, is sent to each Licensee at the proper time.

### CONVEYANCE OF CARBIDE OF CALCIUM.

14. Where Carbide of Calcium is sent or conveyed, the vessel containing it shall bear a label stating in conspicuous characters, the words, "Carbide of Calcium," "Dangerous if not kept dry," and with the following caution:—"The contents of this package are liable if brought into contact with moisture to give off a highly inflammable gas," and also the name and address of the sender.

15. Carbide of Calcium conveyed to or from licensed premises must be conveyed in accordance with the conditions of the license.

### INSPECTION.

16. Any dealer who refuses to show to any Officer authorised by the Council every or any place or all or any of the vessels in which Carbide of Calcium in his possession is kept, or to give him such assistance as he may require for examining the same, or to give to such Officer samples of such Carbide of Calcium on payment of the value of such samples, or who wilfully obstructs the Council, or any Officer of the Council, in the execution of these Acts and the order made thereunder, is liable to a penalty not exceeding twenty pounds.

ALFRED SPENCER,
*Chief Officer.*

21, Whitehall-place, S.W.,
*April*, 1897.

## Prominent Men in the Lantern World.

### No. VII.—Mr. BIRT ACRES.

IT is hardly necessary for us to introduce Mr. Birt Acres to our readers—his name has long been before the photographic public in connection with some of the leading improvements in the art science, but it is more particularly in connection with animated photography that our readers will feel interested in his work. We learn that in 1893 he took out a patent for taking and projecting a series of photographs in rapid succession. Later on, in the spring of 1894, he designed an improved machine for this class of work, and in the spring of 1895 took a successful picture of the Oxford and Cambridge boat race; this picture is, we believe, absolutely the first picture taken of an historical event as apart from the specially-got up scenes with

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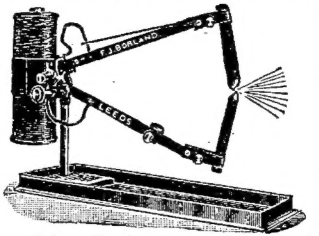

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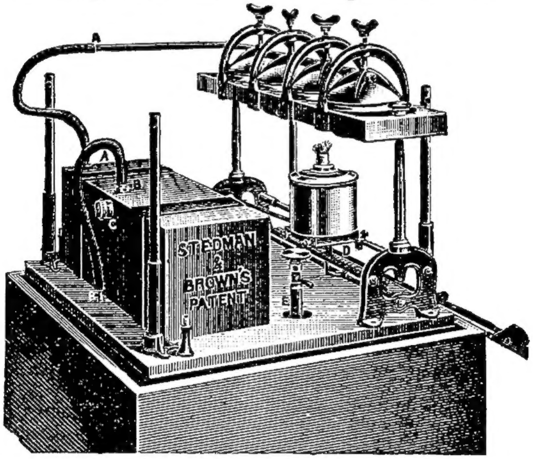

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which the Edison kinetoscope has familiarised us. His other successes in that year were the Derby, in which the clearing the course, the preliminary canter, the race, and the crowd surging over the course are all truthfully rendered; later in the same year he attended the opening of the Kiel Canal, and amongst other pictures obtained a very successful one of the German Emperor reviewing his guard. Towards the end of September he showed to one or two gentlemen well-known in the photographic world these animated pictures on a screen, the picture measuring about 7 feet by 5 feet.

On the 14th of January, 1896, he gave a demonstration at the Royal Photographic Society, and the enthusiasm with which these pictures was received has rarely been surpassed, if even equalled, if one may judge from the roars of applause that followed each series. Since then he has had the unique honour of being summoned to Marlborough House to give an exhibition of his work before the Prince and Princess of Wales and the royal guests invited to the State dinner on the night before the wedding of the Princess Maud. After this exhibition, His Royal Highness gave Mr. Acres exclusive permission to take animated photographs in the grounds of Marlborough House on the following day—the wedding of the Princess Maud—and these pictures turned out highly successful, more particularly the Garden Party scene showing the departure of the Royal bride and bridegroom.

A few weeks ago he gave a special demonstration at the Royal Institution by request of the Board of Management, and also gave an exhibition at the Royal Meteorological Society, showing the form and movement of clouds—a subject in which Mr. Acres takes a special interest.

Mr. Acres is not a showman, and his highest ambition is not to appear at the "halls." He tells us that he has got something "up his sleeve," as the phrase goes, and from what we saw at his works, the many ingenious devices he has invented for getting over difficulties that at first sight might seem almost insuperable, we should not be surprised to see him take a place in front of everyone else in connection with this work, as he was undoubtedly the first in England to exhibit these pictures; so we expect ere long to see him take his proper position—a place he certainly will attain if hard work and perseverance count for anything.

Recently we, together with the editors of our contemporary photographic papers, paid a visit to his works at Barnet, and, in addition to seeing how it was all done (we saw the film coated in length of 1,200 feet without break, cut up and perforated, also the printing machine and special apparatus for developing, washing, and drying the prints), an animated photograph was taken of the party, the scheme of the picture being Mr. Acres discovered sitting by the side of one of his projection machines. He then receives the editors one by one, Mr. Bedding, of the *British Journal of Photography*, being the first to appear on the scene; then Mr. Wall, of the *Photographic News*, next appears, closely followed by Mr. Rowe, of *Photography*; then ourselves, of the *Optical Magic Lantern Journal*; Mr. Snowden Ward, of *Photogram* fame; and finally, Mr. Welford, as representing the latest addition to photograph literature in the shape of *Photographic Life*.

After the usual salutations, Mr. Acres explained the working of the apparatus practically. One of Mr. Acres' assistants then removed the apparatus from the table on which it was standing, and in true English fashion another assistant brought on some liquid refreshment and cigars.

This picture was shown for the first time on Thursday, 22nd ulto., at the London and Provincial Photographic Association, and as each one of the editors put in an appearance he was loudly applauded, and when it came to the refreshment part of the programme the applause was loud and long. It was admitted by all present that this series of pictures, representing as it did Mr. Acres' latest work, was second to none of the pictures that have ever been shown by anybody—the absence of flicker and jump being specially remarked upon—and we heartily congratulate Mr. Acres upon his unqualified success.

We had hoped to have given a portrait of Mr. Acres in this issue, but he says that he has not got a satisfactory portrait that he cares to have reproduced, and pressure of work has prevented his getting one taken specially for us.

* * *

**Clouds in Lantern Slides by Contact.**—Mr. J. Macintosh adopts a novel method of printing in clouds in lantern slides, the details of which he lately gave at a meeting of the North Middlesex Photographic Society. He printed a landscape on a film coated with lantern slide emulsion, and when dry, placed it down on to another film, making pin-holes through both at each corner, and binding with gummed paper, then printing through this from a sky negative. When finished, the register could be easily found by means of the pin-hole.

## *Oil–Incandescent Gas–Acetylene.*

(Manageability and Safety of Acetylene.)

**By E. R. P.**

(*Continued from page* 74.)

IN the first place, in spite of the common statements to the contrary, the evolution of the gas does not entirely cease when the supply of water to the calcium carbide is stopped, for the simple reason that the carbide during the action becomes covered with or buried in a moist, pasty mass of calcium hydrate, which retains enough water to continue the action for

**an indefinite time,**

though slowly. The result is, that if the supply of acetylene to the burners be stopped, the gas collects in the holder; and when the latter is full, the excess escapes under the lower edge through the water, and fills the room with its nauseous smell. This might be avoided by fitting the gas-holder with an automatically-acting escape-valve, like that used on the reservoir of an organ-bellows, which would open when the holder is nearly full, and allow any excess of gas to pass away into an india-rubber bag or similar receptacle.

Also, it should be noted that acetylene is about as soluble in water as carbon-dioxide; and in most, if not all, of the generators hitherto brought out it remains in contact with a large volume of water. Thus, not only is there a considerable loss of gas, but also it diffuses through the water into the air of the room, causing the usual

**unpleasant smell.**

I have consulted several good authorities without obtaining any definite information whether acetylene has any solvent action on india-rubber. If it has little or none, I do not see why rubber bags should not be used to contain the gas instead of the rather cumbrous and splashy water-holders.

In the next place, with regard to the safety of acetylene, I do not think that the fact is yet sufficiently recognised that a mixture of acetylene with air

**explodes far more violently**

than any mixture of coal-gas with air. Theoretically, one volume of acetylene requires two and a half volumes of oxygen for complete combustion; hence, one volume of acetylene gives the maximum force of explosion when mixed with about 12½ volumes of common air. (The same amount of air, it may be noticed, requires the addition of nearly twice as much coal-gas before a dangerously-explosive mixture is formed.) Anyone may prove this fact for himself by testing successive samples of the gases which issue from the outlet of any form of acetylene generator when first put into action. These samples may be collected over a pneumatic trough, for which a common basin or tub will answer. A jar of thick glass, about 6 inches by 1 inch, or a soda-water bottle should be used; but a sharp explosion is obtained even from the contents of a jar of half the size. At first so much air is present that the mixture will not catch fire when a lighted match is held to the mouth of the jar. The succeeding portions explode sharply, with a blue flame. Then the amount of acetylene in the mixture becomes so great that it burns with a dull, smoky flame, passing slowly down the jar, and leaving a sooty deposit on the sides. When this is the case, and not before, it will be safe to light the gas at the lantern burner. I have always used a small brass bottle about 3 inches by 1 inch, made out of an old cartridge case, filling it with the mixture by simply introducing the end of the india-rubber connecting-tube and opening the tap for about a second, then shutting off the gas, closing the mouth of the bottle with the thumb, and removing it a yard or two away from the generator before firing the gas.

I consider that makers of generators, etc., are

**much to blame**

for giving in their printed directions no warning to their customers about the explosibility of a mixture of acetylene with air. The usual directions are simply to apply a light to the burner as soon as the tap is opened. If anything should take the pressure off the gas-holder or reverse its direction, the mixture would be likely to "fire back," and an awkward accident would be the result. One maker has given me the amusing assurance that "to cause an explosion, a light would have to be applied to a volume of the mixture amounting to, say, a room full."

Everyone who has had experience in the eudiometric analysis of gases knows that a mixture of acetylene with oxygen in the theoretical proportions explodes about as violently as any mixture he has to do with. No ordinary eudiometer will stand the shock, and special means have to be taken to lessen its force by diluting the gas and expanding it before passing the spark. In their experiments on the products of combustion of acetylene (*Jour. Chem. Soc.*, Jan., 1897, p. 26), Messrs. Bone

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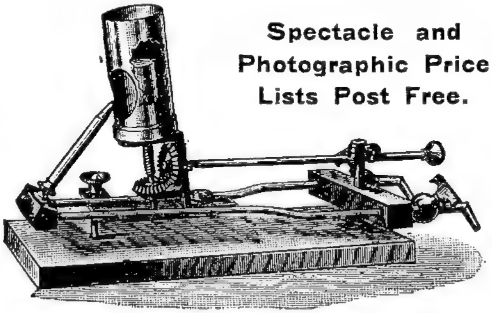

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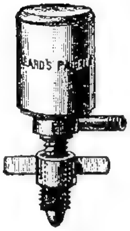

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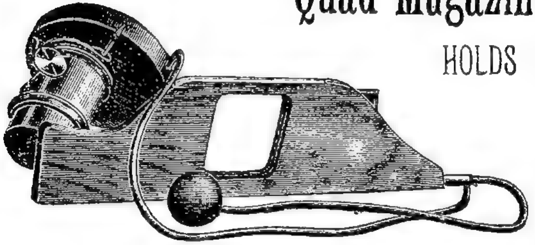

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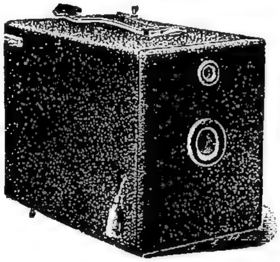

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and Cain had to use a thick leaden pipe of small diameter, and even this sometimes failed to hold together.

But, further, there is an element of instability in the constitution of acetylene itself. **Every schoolboy** who is learning chemistry knows that acetylene belongs to the class of "unsaturated" compounds (though it should be noted that van't Hoff draws the line short of it), whose molecules have their mutual affinities not fully satisfied, and are therefore by no means disposed to "dwell together in unity." The carbon atoms in the acetylene molecule are not united with as many hydrogen atoms as they want, and their residual affinities seem to expend themselves in association with their brothers; a course liable, as usual, to result in "family jars." Hence acetylene can be rather easily separated or "dissociated" into its elements, carbon and hydrogen, either by a high temperature or by a mechanical shock, much in the same way as nitro-glycerine. A lecturer on chemistry of considerable experience told me a few days ago that when a light is applied to a large, tall jar of acetylene, the combustion proceeds quietly down the jar to a certain point, when the temperature becomes sufficiently high to dissociate the rest of the gas with a violent explosion, shattering the lower part of the jar to pieces. I must say that I have not yet succeeded in realising this result with small jars, or with jars 7 inches by 3 inches. (I have no taller jars at hand, but I shall try the experiment again when I can get some.) This tendency to dissociation has no doubt been the cause of those terrible accidents with the liquefied gas (and probably of others also) which have done more than anything else to shake our confidence in the safety of the substance.

Once more, acetylene has the following very exceptional property: In nearly all cases, when substances combine to form a chemical compound, a large amount of **energy is set free,** in the form of heat: but in the formation of acetylene and a few other highly inflammable and explosive compounds such as carbon disulphide and the chlorine oxides, a very large amount of energy is taken in during the process, one gramme of acetylene absorbing an amount of energy equivalent to 48,170 calories of heat. Such substances are known as "endothermic" bodies. This statical energy appears in the form of heat when the compound is broken up, and this evolution of heat, which is added to the heat produced in the combination of the elements of acetylene with oxygen (about 262,000 calories for each gramme) fully accounts for the exceptional violence of the explosion of mixtures of acetylene with oxygen or air.

On the whole, so far "as at present advised," while I think that acetylene as an uncompressed gas (with the compressed or liquefied substance I would have absolutely nothing to) **is fairly safe** in the hands of experienced and intelligent pesons, I cannot yet consider it entitled to a place as an entirely trustworthy and danger-free illuminant. But I fear that many heads will be knocked to pieces before a conviction of the necessity of using exceptional caution in dealing with this very exceptional gas is hammered into them.

## *Stage Scenery for Amateurs.*

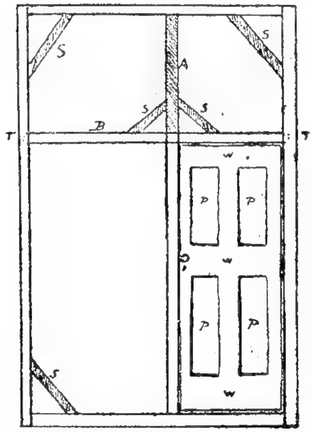
By **A. M. HIDDON.**

*(Continued from page 70.)*

THE first thing will be to construct the five frames for the flats. Order from the timber yard about 250 feet of batten of the size mentioned, and on its arrival, select for the frames the pieces which are strongest and most free from knots, etc. Cut from these ten 9 feet lengths to form the uprights. Next cut ten 6 feet lengths to form the top and bottom pieces of the flats, and then proceed to frame them together—a process which is carried out by means of what is known as "halving." This consists in removing with a tenon saw, half the thickness of the wood for a distance of exactly the width of the stuff from each of the ends; so that when two halved portions are fitted together, the surfaces and edges of the two pieces are flush.

Here a word of advice to the inexperienced carpenter. It is absolutely necessary that the "square" must be used in the marking of all lines for saw cuts. Even the most experienced carpenter could not dispense with this preliminary, and the eventual strength and trueness of the framing will depend upon the exactness with which the marking and sawing are carried out. At the risk of being tedious, a few further hints to the tyro will be given; in marking the wood for the saw cuts, make sure that they are exactly 5 feet 8 inches apart for the cross pieces, and 8 feet 8 inches apart for the uprights. The squareness of the frames will depend entirely on this, and not the over-all length of the pieces. See that every saw cut, which should always leave the pencil mark just visible when the cut is complete, is made **exactly at right angles** to the surface of the wood, and not slantingly in either way; and also that the cut is not carried beyond half the thickness of the material. When the cross-grain cuts have been made, turn the wood on its edge, putting it in a bench vice if one is available, and, with the grain, saw exactly down the centre of the wood until the cross-cut already made is reached, and a piece detached, leaving a sort of step at the end of the length. The opposite end is treated in the same way, taking care that the step is cut on the same side of the wood as the first. Sometimes a little trimming with a chisel will be required to make two halved lengths join neatly, but after a few lengths have been cut in the manner described, the most inexperienced amateur carpenter will become proficient, and the work may be rapidly and easily proceeded with.

All the twenty lengths having been halved, the frames are ready to be fastened together. This may best be done by using a couple of screws at each corner, though $1\frac{1}{4}$ inch cut nails driven through and turned down hold very well. Each separate frame has now to be further elaborated according to the special purpose it is destined for. Thus flats A and E require additional framework for the doors. This is got by the vertical piece A and the cross-piece B. The most satisfactory way is to cut a tenon at each end of the cross-piece B, and mortise it a short way into the frame at C. This, of course, must be done before the framework is fastened together. The vertical batten, A, is then nailed in position, leaving a space for the door about 6 feet high and 2 feet 6 inches wide. In order to bring that portion of A which forms the door-frame, *i.e.*, from the cross-piece B to the bottom, up level with the rest of the frame, nail upon it a strip of batten; this will strengthen the whole frame considerably. Next construct the **frame-work for the doors** so that they just fill up the spaces allotted to them. They are made in the same fashion as the big frames, with perhaps a cross-piece each in the centre at the back to stiffen them. The strips S are short pieces of batten which are nailed on to the back of the flats across the corners. Two or three to each frame are sufficient, but if the scenery is required to last a long time and to stand rough handling, it will be well to nail on a greater number of pieces. Frame E is made exactly in the same way, except the door space is on the left side instead of the right. Frame B, beyond strengthening pieces at the corners and a cross-piece in centre, needs no further work. Frame C has an opening in the middle of its lower half for the fireplace, and is constructed on the same plan as A, except that there must be two vertical pieces to form the side frames of the fireplace, and which should, with the cross-piece, leave an opening of about 3 feet by 2 feet. With regard to frame D, in which the "entrance to conservatory" is, the door should be rather higher and narrower than those in frames A and E; also, if French windows are desirable, some further modifications will be required. Only one of the double doors in D need be "practical," the other being merely a sham one.



Framework of flat A, showing door in position.
B, crosspiece; T, tenon and mortise; W, wood-paper.
P, panels of wall-paper.
(Parts shaded are not on same level as rest of framework).

With the exception of hanging the doors with "H" hinges, only one more carpentry job remains. Take a piece of batten about 2 inches long, and nail it to the back of every one of the uprights of the five frames at a height of about 3 feet from the floor, and also a similar piece about 3 feet higher. On to each of these pieces nail a second strip about 6 inches long in such a manner that it projects 2 inches above and below the pieces already nailed on. These cleats form the means by which the five flats are fastened together into one rigid piece. When this job is finished we have the frames complete, flush, level, and without any projection on the one side, but the reverse of this at the back.

The next thing to do is to procure from the builder or house decorator a sufficient quantity of the coarse sacking canvas which is used by them for partitions, etc. This canvas, which resembles a very coarse and strong muslin, is sold in widths about 6 or 7 feet wide, and costs but a few pence a yard. With $\frac{1}{4}$ inch tin tacks nail the canvas on to the front of the frames, straining it as tightly as possible all ways, using plenty of tacks, and nailing it down to every cross-piece and upright which is on a level with the frames. The door frames are covered in the same way, but, of course, the space for the fire-place is left uncovered.

*(To be continued.)*

## *New System for the Manufacture of Acetylene.*

ACETYLENE gas, both in the liquid and gaseous state, presents certain inconveniences as an illuminant. In the first state it may, owing to its endothermic properties, decompose spontaneously under the influence of an abrupt rise of temperature and cause explosions, the violence of which has been sadly demonstrated. In the gaseous state the least escape may produce equally dangerous explosive mixtures. The only practical method, then, to utilise the remarkable lighting power of the gas seemed to be by employing the **method of M. Bullier,** which consists in diluting the gas in another inert gas, for example nitrogen, the luminosity of the flame being unimpaired, and the risk of formation of explosive mixtures greatly diminished.

But it is evident that for small consumption this system cannot be recommended, as it would involve considerable expense in obtaining and managing a generator, the manufacture of nitrogen, and also gas-holders for the two gases.

Such a method might be adopted as we have seen in a town furnished with a complete plant for manufacture of lighting gas, which was willing to replace the latter by acetylene, a supposition the realisation of which is not impossible when calcium carbide can be made more economically than at present.

In the case of small quantities of gas, and it seems it will firstly be consumed thus, another method had to be invented. This question was studied and to some extent solved by Messrs. Claude and Hess, who hit upon the idea of manufacturing acetylene, **dissolved in an inert liquid** very similar to the carbonic acid of seltzer water syphons, instead of the liquid acetylene compressed at dangerous pressures. Of all the liquids tested by the two inventors, acetal, acetone, methylal, acetate of ethyl, acetate of amyl, that which gave the best results is acetone, a colourless liquid with density of 0·800, not too volatile because its vapour tension at 17° does not exceed 160 millemetres, and easily manufactured, cost price being little, as it can be obtained by simple calcination of acetate of lime, and it dissolves according as it is more or less condensed from 30 to 35 times its volume of acetylene at the ordinary pressure.

If everything consisted in absorption of these 30 or 35 volumes of gas in the dissolvent employed, the result obtained would be trivial from the industrial point of view, the more so as it would require a regular series of manipulations to extract the gas stored in the liquid and convey it to the burners. But we are aware that solubility of gases in liquids increases about proportionally with the pressure. Thence, two immediate capital advantages; firstly, if instead of dissolving acetylene in acetone under atmospheric pressure, we work under 2, 3, 4, . . . . 10 atmospheres, instead of 30 or 35 litres of gas there are 50, 75, 100, . . . . 250 litres stored in one of acetone. Besides, gas thus stored under pressure is ready for immediate use; it will suffice to gradually turn the tap uniting the gas-holder with the burner (in practice an automatic pressure expansion governor will be employed) for the dissolved gas to escape like **bubbles of carbonic acid gas** in seltzer water syphons. When all the gas has been thus utilised, except that remaining dissolved under atmospheric pressure, the consumer will merely have to change the exhausted gas-holder for a new one, the former being immediately saturated with fresh gas under pressure at the acetylene works. Such, in short, is the method.

Perhaps some will ask an explanation so as to avoid dangerous pressures in consequence of liquefaction, the acetylene solution being itself characterised by employment of pressure. To demonstrate the superiority of the system in this respect it will suffice to observe that the pressure is as slight as desirable, and depends solely on the quantity of gas stored instead of being invariably fixed at high rates by the physical constants of liquid acetylene. Thus, for example, a "dissolved acetylene" gas-holder, although containing a large amount of gas, may only have a slight pressure of some atmospheres to support, whereas a recipient containing liquid acetylene, however little the temperature increases beyond 37·5 C., will have more than 70 atmospheres to support. We may, in fact, class amongst the

**objectionable properties**

of liquid acetylene the fact that its pressure increases very rapidly with the temperature, becoming triple from 20° to 38° C., whereas that of dissolved acetylene in acetone only slowly increases with temperature scarcely being doubled from 20° to 50° C.

From the preceding remarks we may at once conclude that while liquid acetylene must be placed in very heavy thick recipients, capable of resisting all pressure developed, on the contrary, dissolved acetylene only requires a light holder, very suitable for portable lamps in particular, but of very slight danger in case of rupture and realising owing to this lightness a specific storage at least equal to that of liquid acetylene. This last feature is very interesting, and is not due exclusively to the remarkable dissolving power of acetone for acetylene, but also to the relative weakness of the co-efficient of expansion with the dissolution temperature obtained. In fact, it is known that liquid acetylene has an enormous expansion co-efficient. As a precaution to ensure safety, the vessels containing it can only be filled two-thirds; dissolved acetylene under pressure, on the contrary, has an expansion co-efficient, which although varying with the pressure employed, is always much less than that of liquid acetylene. The holders may then be filled almost completely without fear, and there is no danger of rupture from over-filling. Let us add that as regards spontaneous decomposition, under the influence of sudden increase of temperature and pressure it seems probable, although the inventors have not yet made any conclusive experiment in this respect, that this cause of danger is greatly decreased by the fact that the gas is dissolved in an inert liquid. It resembles, in a way, the case of dynamite compared with nitro-glycerine, only to mention this example taken from the technique of explosives.

In short, this new mode of distributing acetylene seems to remove all the objections made against methods hitherto employed. There would then be nothing astonishing if, thanks to the new idea, acetylene won back all its first popularity.—"*Revue Technique.*"

# *Architecture as a Subject for Lantern Slides.—No. VII.*

By T. PERKINS.

BEFORE speaking of the way to develop negatives of architectural subjects, I will give a few extracts from the note-book in which I enter my exposures, with remarks upon the finished negatives, making only one alteration from what is actually to be found in the book. This alteration consists of reducing the exposures to one and the same stop, viz., $\frac{f}{16}$, although as a matter of fact different stops were used for different exposures. Thus, if I actually gave one minute's exposure with stop $\frac{f}{11}$ it will be found entered here as two minutes with $\frac{f}{16}$, and if I gave five minutes with $\frac{f}{32}$ it will be found as 1¼ minutes with $\frac{f}{16}$.

June 25th, 1896.—Milton Abbey, Dorset, 2 p.m. to 4 p.m. Bright summer day.

Interior of the hall; oak wainscotted, with reddish coloured walls above the wainscotting, dark oak roof, windows white glass, a well lighted interior. Thomas's anti-halation plate, extra rapid, 2½ minutes' exposure; somewhat over-exposed.

Marble statue in conservatory. Anti-halation plate, ordinary (half the speed of former), ¼ second; good.

Font in the Abbey Church, consisting of two life-size marble statues, standing over a marble shell-shaped basin, in the transept, white glass windows. Imperial ordinary plate, about 80 Hurter and Driffield, 10 seconds; good.

Distant view of the abbey across the park with woods behind it, buildings of lightish colour. Same batch of plates as the last, ¼ second; good.

September 7th, 1896.—Charminster, Dorset, 11 a.m. to 3 p.m. Bright sunshiny day.

Interior of the church from west end, white glass. Anti-halation plate, extra rapid 1¼ minutes; good negative.

Monument against the interior of south wall. Imperial ordinary, ½ minute; good.

Exterior of the church. Plate of the same kind as the last, ½ second; good.

Dark carved oak mantelpiece at Wolverton House, lit by a window opposite to it, but the upper part in shadow. Imperial ordinary plate, 4 minutes; would have borne double the exposure with advantage.

November 10th, 1896.—Christchurch Priory, Hants, 11 a.m. to 3 p.m. Bright sunny day.

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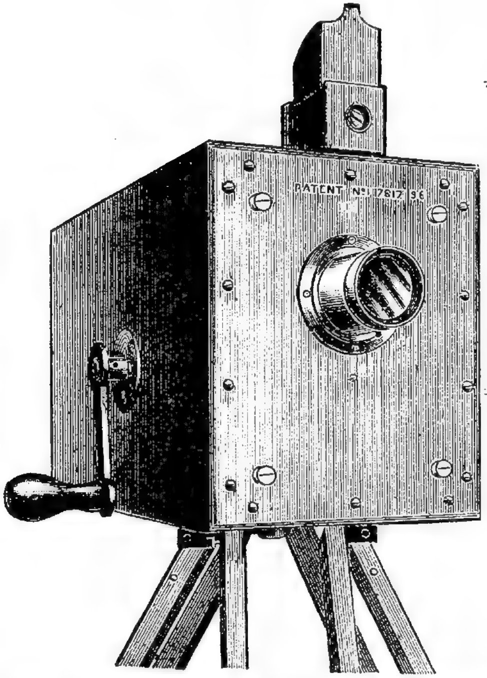

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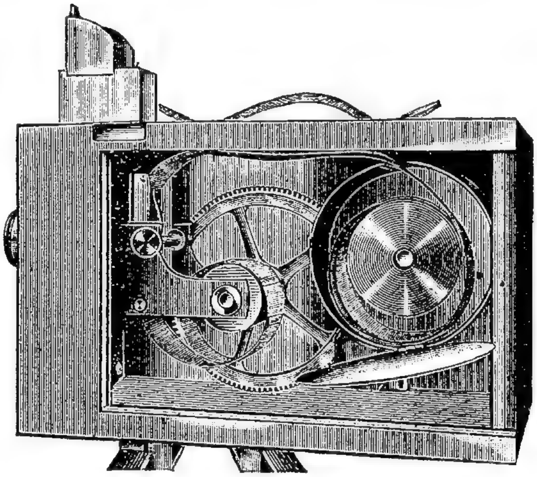

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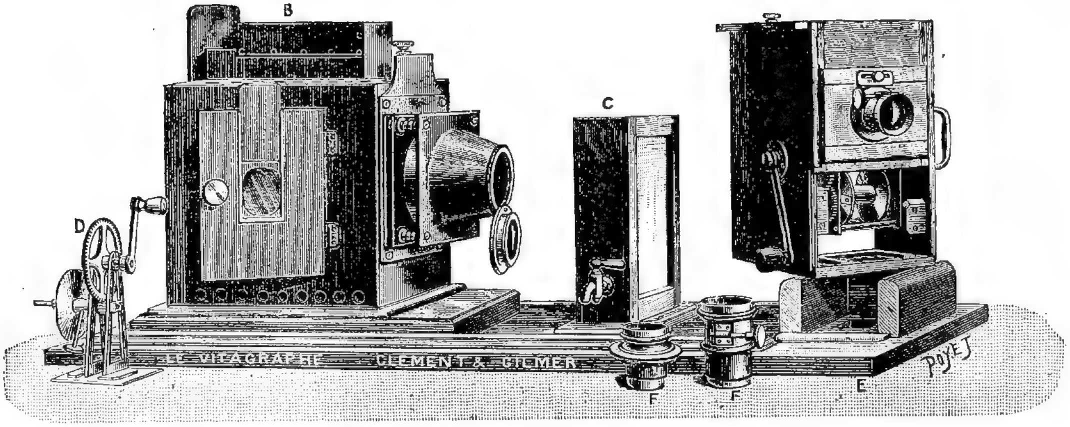

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November 25th, 1896.—Same building, plates, etc. The choir looking westward, the stalls dark oak, the walls above light stone, lit with gleams of sunlight, the windows for the most part uncoloured glass, 4 minutes; good result, save that from the extreme contrasts in the subject some shading of the negative during printing is needed. Chamber known as "St. Michael's Loft" over the choir, well lit, white windows, sunlight on the floor, 3 seconds; good negative. Carved stall in north side of choir, 2½ minutes; good.

March 27th, 1897.—West Stafford Church, 12 noon to 1 p.m., sunny day. Backed Imperial ordinary plates, H and D speed number 80. The church has white glass in its few small windows, but the lighting was so poor that I could not see to focus with a stop of $\frac{f}{16}$ and had to turn the camera round and focus the lead dividing the panes of a window which was about the same distance from the lens as the screen I wished to photograph. Exposure 2½ minutes; excellent negative.

These notes may be of some use as a

**guide to exposure,**

Fortunately there is a considerable latitude in exposure, or the obtaining of a good negative under such various conditions of lighting as one meets with when doing interior photography, would be almost an impossibility.

I will bring these notes on exposure to a close with a short account of a day's photography under difficulties, when out of ten exposures I was lucky enough to lose but one plate. It was on February 3rd of the present year that being on business at St. Albans, Herts, and having from 9 a.m. till 1 p.m. free from other engagements, I resolved to secure some negatives of St. Michael's Church and of the cathedral that I had been unable to make on a former visit to the same city. My plates were backed Imperials H and D speed number 110. The morning was not very promising, slush formed of half melted snow under foot, fog over head. However, I took four plates with me and made my way to St. Michael's Church, famous for its Saxon tower, and monument of Francis Bacon (Lord Verulam), being greeted by several wayfarers with the remark "not much of a day for your work, eh?" I found to my great disgust that the old tower had been pulled down, and that a new one was being built, but the great Lord Chancellor was seen sitting all in marble in his niche in the chancel, such as we may well imagine him to have been in life—a realistic statue—very characteristic for its age. An exposure of 16 minutes with stop $\frac{f}{23}$ resulted in an excellent negative. Then I came outside the church and got a good view of the south wall of the chancel with an interesting window and an ogee-canopied tomb, and then met with my one failure in attempting to get a photograph of the east end of the south aisle or chapel, interesting for its half timber gable. The mist and the diffused glare caused by the snow fogged the plate so much that it is only valuable to me as just indicating the peculiar features to be met with in the building. The one remaining plate I took to the cathedral church and began an exposure on the famous screen dividing the choir from the shrine of St. Alban. As I decided to leave the camera with the plate being exposed while I went to my hotel to get my remaining backs, I turned the iris down to $\frac{f}{45}$, thinking as the light had improved that the picture would be done by the time I could get back again—that was in about a quarter of an hour. But when I did return I found the fog, which had greatly thickened, had so darkened the church, that I could hardly see a single detail of the screen as I looked at it. The picture could not be done I thought, and there seemed no prospect of its ever being done that day, but it was no use stopping that exposure and beginning another, so I just let the camera alone, and sat down and warmed myself at a stove and talked on architecture in general, of restoration and Lord Grimpthorpe in particular, to the intelligent lady who fills the office of verger, till an hour and also the mist had rolled by. Then I capped the lens, but with greater feelings of uncertainty than ever before as to what the result would be. The result, however, much to my gratification, is an excellent negative.

*(To be continued.)*

* * *

## *The Lanternist's Practical Cyclopædia.*[*]*—No. VI.*

**By CHARLES E. RENDLE.**

COMIC SLIDES.—As the term implies, slides pertaining to humour, or humorous subjects. Slipping slides and rack slides are for the most part of the comic order. Many lanternists make their own slides of this class as occasion demands. Happening to visit a town during election time, merriment may often be caused by roughly drawing on ground glasses, 3¼ inches square, caricatures of the candidates.

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[*] All rights reserved.

**Compressed Gases.**—All gases being elastic can be compressed by pressure, the volume of a gas being inversely proportionate to the pressure brought to bear upon it. Example—the greater the pressure, the lesser the volume. If the pressure is doubled the volume is halved, whilst if the pressure is halved the volume is doubled. As the normal pressure of the air is 15 lbs. to the square inch, and the gas compressed in the gas cylinder at a pressure of 160 atmospheres, we get 160 by 15, equal to 2,400 lbs. to the square inch.

**Concave.**—A curved hollow, to make hollow—opposite to convex.—*See* Lenses.

**Concavo Concave.**—Concaved on both surfaces.

**Condensers.**—Anything that condenses in optical projection. The condensing lenses causes the rays of light to pierce the transparency from all points, which is transmitted to the objective, or focusing lens. The all important part of the lantern's optical system is the condenser, for without it the most perfect illuminant known would be practically useless, and only light up the centre of a picture, whereas, by the aid of condensing lenses little need be lost, if the adjustment be correct. The most popular, and economic in general use, is what is known as the plano-convex, and consists of two lenses of equal dimensions cut plano-convex, one side being plane or flat, the other side being convex. They are mounted so that the two convexes come together, until they nearly touch, the flat sides pointing respectively to the service of light on the one side, and the transparency on the other. Although as above stated, the plano-convex is that in general use, there are many other forms employed in the highest makes of scientific instruments, among which may be mentioned the Herschel condenser, of two lenses, a meniscus, and a double convex, the Dallmeyer, two lenses, a plano-convex flint lens, and a crossed lens of crown glass, etc., besides various forms of triple condensers, and condensers with four lenses. The great authority on this subject, the late J. Traill Taylor, said no condenser was a perfect condenser unless it had three lenses.

**Conundrum Slides.**—These are mostly made on the slipping slide principle, so that the question is shown on the screen, and disappears as the answer takes its place, such as, Why are the British the most miserly race on earth? Answer: Because for sixty years they haven't changed a Sovereign.

**Contact.**—Touching, or close union.—Making lantern slides by contact is to place the sensitised film of the lantern plate against the film of the negative. This is known as direct contact.

**Convex.**—A rounded form, as the outside of a spoon.—*See* Lenses.

**Convexo Convex.**—Convex on both sides.

**Convexo Plane.**—Convex on one side and plane on the other.

**Copper.**—An important metal largely used in the arts and sciences, and known from the earliest times. Considerable quantities in the metallic state are found in North America and many parts of the world, including the British Isles. The district of Swansea may be taken as the most important smelting locality known. Metallic copper has a reddish colour of its own; hence we sometimes read of copper colour. It is very malleable and ductile, possessing great tenacity. It is nearly nine times heavier than water, and although not a perfect conductor, is one of the best conductors of heat and electricity. Many of the copper alloys are valuable. Brass is an alloy containing two-thirds of copper and one-third of zinc. This is sometimes improved by the addition of one to three per cent. of lead. Many other alloys there are to which copper is the main factor. Fine Swedish copper is also used in the alloying of gold and silver.—*See* Alloys.

**Cosmorama.**—A series of views of different parts of the world, so arranged that they follow one another in cosmoramic or cyclographic succession. Cosmoramic, actual visual effect.

**Cover Glass.**—A clear piece of glass placed next the film of the lantern slide in order to protect it from damage. —*See* also Cloud Cover Glass.

**Curtains and Curtain Slides.**—An efficient lantern is furnished with a curtain made of black velvet or other dark material, and arranged to slide by means of small metal rings on a semi-circular rod round the back of the lantern body. Its purpose is to obscure the glare of light that otherwise proves objectionable to that part of an audience seated behind the apparatus. Curtain slides are used principally in opening or closing an exhibition much in the same way as the curtain at the theatre on rising discloses the opening scene of action, and falling on the climax of the piece. These slides are made in innumerable designs, and may be obtained to suit the requirements and tastes of the most fastidious. The roller curtain is but a sheet of brass with a hole in it, fitted to bi-unials and triple lanterns and arranged to pass between objectives and condensers, allowing the emission or obstruction of the light at the will of the operator. Usually they are fitted with a rack and pinion attachment, thus giving a perfect uniformity of action.

*(To be continued.)*

# *The Invention and Development of the Optical Lantern.*

By **EDWARD DUNMORE.**

## CHAPTER XIII.

LANTERN slides, before being pronounced ready for use, must be mounted, that is, have a suitably shaped matt attached and be protected by a cover glass, to which they are fastened by the process of binding. There are two ways of procedure—one by hand alone, and the other by aid of the lantern slide binding clamp. The masks and strips can be purchased ready for use, or they may be home-made. In the latter case a sufficient quantity of some dark-coloured, thin strong paper — needle paper answers very well—is procured and brushed over with a coating of thick mucilage, to which a little sugar has been added to prevent it drying and peeling off, and is hung up or laid out to dry. It can then be cut up into strips three-eighths

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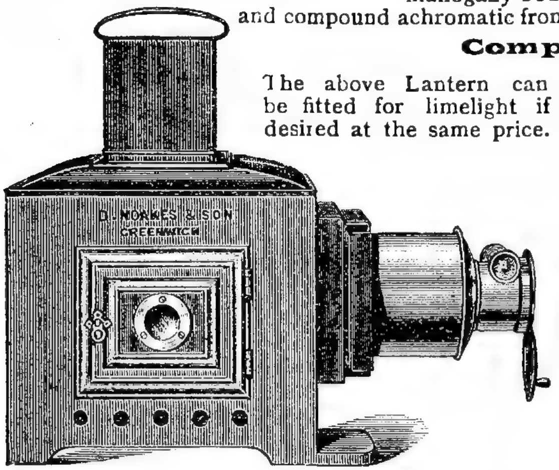

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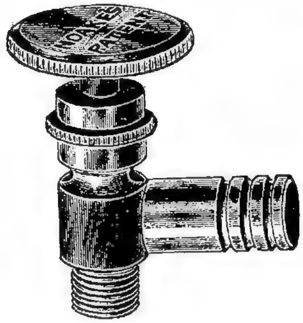

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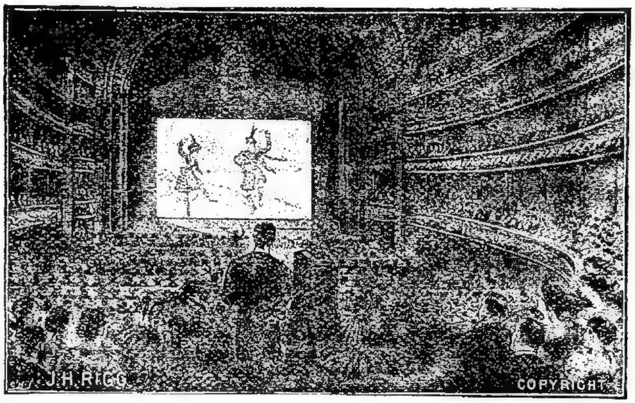

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of an inch wide and fourteen inches long and kept flat under pressure, each strip being sufficient for one slide. Zinc shapes can be purchased as

**guides for cutting masks**;

some black paper, a wheel-cutter, and a sheet of glass or hard wood are necessary. A suitable shape being laid on the black paper, previously cut into squares on the glass or wood a trifle less than the size of the slide, the wheel cutter is steadily passed round the shape, cutting a clean-edged mask. A ragged, uneven edge has a very ugly appearance on the screen, the least want of symmetry is immediately noticed; therefore, unless the mask is a clean, truly cut one it should be discarded. In a general way it is better to buy the masks ready cut.

The slide being laid face up, the mask is adjusted on it, and again on this a piece of perfectly clear glass free from all bubbles, striæ, or scratches, taking care that no dust, fragments of paper, or anything else is enclosed between them. The binding strip is laid flat on the table and moistened; the slide mask and cover being firmly held between the finger and thumb has one side placed centrally on one end of the gummed strip, and, so to say, rolled along it until attached to each side. The projecting part is folded down on the slide and the corner nicely smoothed. Some snip the paper at the corner with a pair of scissors and fold over the ends, which is perhaps the neatest way, although not quite so expeditious as simple finger pressure. A couple of small patches of white paper are then stuck on the two top front corners of the slide as a guide to putting them in the lantern, these white discs being more easily seen in the dull light of the room than the image on the slides themselves, and obviates the mistake of showing the pictures upside down or on the wrong side. As a finish to the slide the number and title is written on the binding with white ink, when the lantern slide may be considered complete.

**The binding clamp**

is a small metal instrument to retain the slide and cover in their proper positions by aid of a clamping screw, and at the same time permit the slide to be revolved. In this case the binding strip is moistened, attached fair and square to one edge, and by revolving the slide each edge receives the paper in its turn; the edges are turned over, pressed into contact between the finger and thumb, corners smoothed, and the binding is complete. With this plan there is no fear of the parts shifting, and the work is more rapidly done.

*(To be continued.)*

## *Slides.—No. VI.*

By F. J. SCRIMGEOUR.

*(Concluded.)*

MY last chapter concluded by saying that pretty pictures are far more suited to the taste of the general public than are mere mementos of travel, however interesting such scenes may be to the lecturer himself. Some difficulty might be found, I admit, in artistically illustrating certain subjects, but then that fact alone should be sufficient to veto it for popular audiences. Is it possible that here we might find the answer to the question "Why are lantern lectures losing their former power to attract the masses?" Do we always remember that to secure a popular audience one essential is a popular subject?

On the other hand, the select gathering which assembles to listen, in breathless attention, to the lecturer's opinion regarding "The remaining Greek manuscripts of the 4th century B.C." does not expect a predominant feature of the illustrations to be their artistic beauty! I have heard a coterie of ardent photographers assert that a general popular audience

**cannot tell a good slide from a bad,**

as long as there is no scrimping of the primary colour. That is untrue. Any gathering can, and does, appreciate an artistic slide. There are those—and their name is legion—who, although not art critics, painters, or even amateur photographers, are as able to separate the sheep from the goats in a flock of slides, as we ourselves are. If lecturers would only exhibit slides which thoroughly pleased themselves as art critics—if they would criticise their transparencies, as they do an exhibition of oil paintings—from an artistic stand-point only—the wail regarding empty chairs and bare forms would soon cease. Above all, beware of a box of mementos.

Variety is another essential for a successful exhibition or lecture. Even highly artistic slides may grow monotonous if the subject of each picture is much the same. A case in point. I am acquainted with a lovely set of slides representing the interiors of the English cathedrals. Each transparency is a thing of beauty, the gradation is perfect, the colouring superb. As a set, these slides are at the same time a great success and a dismal failure; technically and artistically the set is entirely successful, but the

**persistent monotony**

outweighs that side of the balance. The first slide makes the audience sit up; the second takes their breath away; a united "Oh" greets the third; the sixth calls forth exclamations from the children; a pin might be heard to fall on the appearance of the tenth; a box of pins might spread themselves unnoticed by No. 20, and then the interest distinctly fags. Is there any reason to be surprised?

To correctly define an artistic slide is extremely difficult, in fact, a general definition is impossible, as no two people have quite the same idea. The rules for the production of a picture in any form are, of course, applicable in the case of transparencies for the lantern. When dealing with photograph prints on paper, we have a choice of surfaces, rough or smooth, matt or glazed, and also the selection of a mount and frame to assist us to a certain extent. In lanternism, however, both surface and surroundings are denied us, and the image must rely upon itself to give an artistic picture. Of the two wants mentioned, absence of border is the most important, and to it is most frequently due the disappointment with which we compare a slide and print from the same negative. The method advocated by Dr. Tulloch of Dundee, of printing a **white border** between the mask and the actual image, is a splendid idea, and will, no doubt, grow in popularity, at least with amateurs. In the trade manufacture of slides, difficulty would be found in adopting the idea, as a cloudless sky by no means lends itself well to the method, and as we all regret, natural clouds seem to be in quarantine with the "trade" in general.

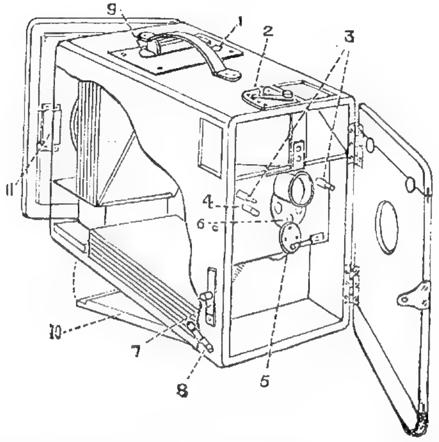
Variation of surface is impossible for practical purposes. But it is not all grumble! The lanternist with his slides has what some photographers consider a great advantage over paper prints. And, mark you, there are those who declare that what we lack by want of matt surface, hairy canvas mount, and discoloured cork frame is as 0, when compared with the great power we have in being able to produce **"fuzzitypes"** at will by half a turn of the focusing screw. One half turn gives softness of definition; a whole turn brings the view wonderfully near the impressionist school, and by continuing the process, there seems to be no limit to the height, on the artistic scale, to which we may raise each and every slide. On the other hand, there are those who prefer to keep their pictures as near the bottom of such a scale as a clear eye and an even working rack lens adjustment will allow. Softness of definition—especially when it owes its origin to the milled head—they abhor. These people I would like to shake hands with now.

And so we have found that the lanternist must present his picture to the audience without any foreign helps to the artistic, and for pictorial beauty must rely on the actual image alone. This fact should teach the operator, if he be a photographer also, to devote care, skill, and time to the selection of the original view; or, if a lanternist only, to forget the valuable, time of the dealer's shop assistant, and choose his slides as if they were worth their weight in gold, a sentiment which I need not warn you to forget when settling the account.

## NEW APPARATUS.

### BIRKBECK HAND CAMERA.

Mr. E. G. Platt, of Birkbeck Road, Dalston, N.E., having enlarged his workshops and added new machinery, is now busy manufacturing a neat and useful hand camera of the magazine class. Twelve plates in sheaths are inserted at the back of camera by means of the door marked 11 in cut, and the focusing is regulated by the movement of an arm 2, the lens front sliding on the two rods marked 3. Immediately below one of these is a knob, 4, by means of which the shutter can be set either for time or instantaneous work. The lens, which is of the R.R.



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**Patent Russian Iron Lanterns, No. 2459. Patent Lanterns, The "Metamorphoser," No. 15440. Patent Lanterns, The "Terpuoscope," No. 12860. Patent Telescopic Bi-unial and Tri-unial Lanterns.**

**"Stocks'" Patent Paraffin Oil Lamps of 125 Standard Candle Power. Patent Cinematograph Projector. Patent Cinematograph Camera. Patent Lanterns of all descriptions. Celebrated "Ejector" and other Lime Light Jets. Celebrated Lime Light Apparatus. Celebrated "Hardazion" Limes, etc.**

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**LIST ON APPLICATION**

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class, is fitted with rotating diaphragm 6, while the relative speed of the exposure is controlled at 5, the release knob, which is extremely sensitive, being at 7. This release can also be locked so that there is no chance of the plate being accidentally exposed. The changing of the plate is effected by a forward push on the projection 9, and at the same time the number of the plate appears at a slot situated at 1. After the plates are exposed they fall flat on the bottom of the camera, from whence they can be removed at the opening or door marked 10. The camera is made in mahogany, and is covered with leather.

### RECEPTACLE FOR CALCIUM CARBIDE.

For the storage of calcium carbide, Messrs. Thorn and Hoddle have introduced an air-tight galvanised iron tank, of the shape shown in the illustration. It is made in four sizes to hold 28 lbs., 56 lbs., 1 cwt. and 2 cwt.

### WOLFF'S NEW FILMS.

Since we made mention in last journal of the list of films for cinematographs published by Mr. Philipp Wolff, he has been able to add the following interesting pictures to his stock, viz., Carnival in Paris, Haunted Castle, On the Roofs, Nightmare, Devant's Hat Trick, and Bicycle Carnival.

:o:

## PATENT INTELLIGENCE.

*The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.*

No. RECENT PATENT APPLICATIONS.

6997. 17th March, 1897. G. Periore, E. Sarel, and B Cruvellier. Improvements in the manufacture of acetylene gas, and in apparatus therefore. (Date applied for under Patents, etc., Act, 1883, Sec. 103, 5th November, 1896).

7043. 18th March, 1897. T. Lyons, J. Lyons, and J. Pearson. Improvements in acetylene gas generators.

7168. 19th March, 1897. F. S. Thorn and C. Hoddle. Improvements in acetylene gas generators.

7170. 19th March, 1897. T. Batty. A new or improved optical toy.

7214. 19th March, 1897. L. Gaumont. An open-work or perforated screen for obviating the effects of the scintillation experienced in viewing projections of animated photographs.

7629 24th March, 1897. H. L. Kerdel. An improved form of optical or magic lantern slide carrier.

7635. 24th March, 1897. J. H. H. Duncan and T. Reich. Improvements in apparatus for making and exhibiting kinetoscopic pictures.

7744. 25th March, 1897. E. G. Brewer (the firm of Gesellschaft fur Acetylene-Gaslicht, Basel, Switzerland). Improvements in apparatus for generating acetylene gas.

7782. 25th March, 1897. H. H. Lake (F. Ferraccin, Italy). Improvements in apparatus for automatically generating acetylene gas.

7929. 27th March, 1897. F. H. Smith. An acetylene gas lamp or generator.

8108. 30th March, 1897. J. G. A. Kitchen. Improvements in or relating to acetylene generators.

8266. 31st March, 1897. F. S. Thorn and C. Hoddle. A new or improved safety valve for use with acetylene gas generators.

8270. 31st March, 1897. J. G. A. Kitchen. Improvements in and relating to acetylene generators.

8410. 1st April, 1897. C. Lauri and T. Gardner (L. Dorville, France). Improvements in apparatus for the projection of images of figures or scenes.

8551. 3rd April, 1897. J. H. Exley. Improvements in apparatus for manufacturing acetylene gas.

8552. 3rd April, 1897. H. Cousin. Improvements in apparatus for manufacturing acetylene.

8566. 3rd April, 1897. C. A. Lee. Improvements in or additions to apparatus for the production of living pictures or animated photography.

8721. 6th April, 1897. V. Menne. Improved acetylene gas generator.

8793. 6th April, 1897. W. P. Barltrop. An improved apparatus for the production of acetylene gas.

9097. 9th April, 1897. W. Friese-Greene. Improved means or apparatus for producing animated or kinetoscopic pictorial effects.

9217. 10th April, 1897. L. Gaumont. Improvements in enlarging apparatus for photographic purposes.

### SPECIFICATIONS PUBLISHED.

*Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.*

8418 of 1896. Bonn. Projection of photographs of animated subjects.

23591 of 1896. Trouvé. Apparatus for producing and storing acetylene gas.

23592 of 1896. Trouvé. Apparatus for producing and utilising acetylene gas.

7817 of 1896. Oulton, Shaw & Adams. Apparatus for taking and exhibiting series of photographs.

11737 of 1896. Clansolles. Apparatus for the production and storage of acetylene gas for illuminating purposes.
12788 of 1896. Gibbs. Generation and storage of acetylene.
24558 of 1896. Lake (Hanotier and Hostelet). Lamps adapted for producing and burning acetylene gas.
27807 of 1896. Raup. Acetylene gas burner.
2284 of 1897. Carter. Production and storage of acetylene gas.
5026 of 1897. Rateau. Photographic cameras applicable also for use as or in connection with kinetoscopes and magic lanterns.
911 of 1897. Doix. Acetylene gas production.
1950 of 1897. Liesegang. Optical projecting apparatus.

—:o:—

## Correspondence.

### CALCIUM CARBIDE AND THE LONDON COUNTY COUNCIL.

*To the Editor.*

SIR,—The promised regulations have at last been published, and those who use acetylene occasionally for magic lanterns or photographic purposes, now find themselves either ignored altogether or else placed under very unfair restrictions, and it is hard to say which of these positions the L.C.C. intend to maintain. The rules say that no exemption is made, and a license of 5s. a year is necessary for keeping any quantity, for sale or private use, of calcium carbide. This is all very well for dealers and large consumers who must have in hand a constant supply, but it would be rather hard on the man who buys now and then just enough for a lantern display and wants no more. There are other points about these regulations which call for notice. No license will be granted unless the carbide is pure. How is the ordinary user to know if it is pure or not? No fire or artificial light should be taken into or near any building or place where an acetylene generator is situated. This is simply absurd! You might as well forbid a gas company having lights in their works or near their gas holders. The excessive caution displayed in the notices that are to be put on packages of carbide, and the general tone of these special rules seem to show that the Home Office and L.C.C. know very little practically about the substance they are endeavouring to regulate. They have succeeded in thoroughly frightening themselves, and now want to frighten everybody else. But no one who has already used the material is likely to do more than smile and use it again, and probably a good many people will do so without troubling their heads about the L.C.C. or the license either. If greater stress had been laid on the dangers of acetylene in a highly compressed or liquid state, and the use of generators forbidden when they produce the gas under heavy pressure, the regulations would have been of vastly more service as regards the general public safety, and a good deal of grandmotherly advice as to the storage of carbide might have been dispensed with.

C. H.

[On another page will be found full particulars of the conditions imposed.—ED.]

## Notes and Queries.

*Subscriber (Otago).*—(1) You will find the apparatus good. (2) The saturator should not be packed too tightly; that, which the firm referred to in No. 1, supply with their apparatus is excellent.

*Mauritius.*—(1) Probably the paste has soured with the damp, it might have been advisable to put some alum in the mixture. If, however, this does not remedy matters (you must first clean off the old coating), why not face the screen with white paper. (2) and (3) Silver-faced screen made by Field & Co., 142, Suffolk-street, Birmingham. (4) The machine you spoke of was a failure, after enjoying a short period of popularity, and we believe the company was eventually wound up. Even if you managed to get one second-hand, you would require to have an attendant to assist it. (5) The monthly paper *Athletic Sports and Pastimes* is published at Salisbury House, Salisbury-square, E.C. Price 1d.

*W. F. Hanna.*—For general purposes, the larger diameter.

*Harold H. Whiston.*—We are not dealers, hence cannot make you any offer for the list of slides you send; doubtless many of our readers would entertain a purchase if the particulars were brought before them in the advertisement columns.

*Regular Reader.*—Something of the kind may be held at the Crystal Palace during the summer.

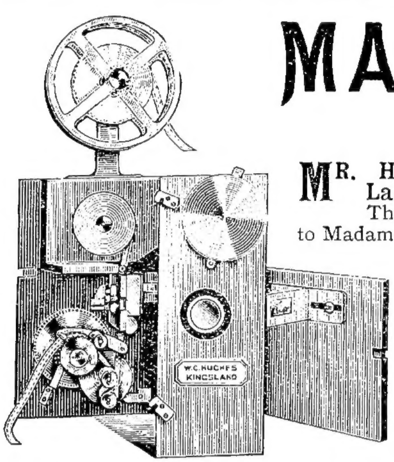
*Victor Pitot.*—(1) The effect can be produced after the style of the ordinary opaque lantern, with about ten thousand candle-power illumination, the lights need not be so close as to give inconvenience. The lens employed should be of very long focus. (2) You can get the coloured slides, with spectacles, from Messrs. Newton & Co., 3, Fleet Street. (3) From Messrs Colt, Nassau Street, San Francisco, see particulars in our issue for last January. (4) Letter was forwarded to Mr. Ives.

*J. H. White.*—"The Beginners' Guide to Photography," published by Perken, Son & Rayment at six-pence.

*Perplexed.*—Are you certain that the lenses are of the focus you understand them to be? It is possible that you are confusing the terms "picture" and "disc." If you employ a lens of 8 inch focus and place the lantern 25 feet from the screen, you will, with a circular opening of three inches diameter in the slide, obtain a disc of about 9 feet, but if the opening in the matt on the slide is smaller, the disc will be reduced in proportion.

*S.*—Thanks very much. We consider the presentation of the picture to the North Middlesex Society by Mr. Murrow a piece of presumption on his part, it was without the knowledge or sanction of ourselves (J. Hay Taylor), or any member of the family. The picture was obtained by him privately, and it was never intended that he was to make a public presentation. He must have done so in ignorance of the fact that it is usual that such presentations come from the immediate family, and in this instance there are three sons and one daughter living in London.

*G. S. J.*—Building a bi-unial appeared in the following numbers of this journal: October, November, December, 1893, and January, March, May, September, October and December, 1894. It is impossible to quote the journals in which articles pertaining to saturators have appeared, they are too numerous, but if you get the January number of each year, which contains the index, you will be able to ascertain definitely.



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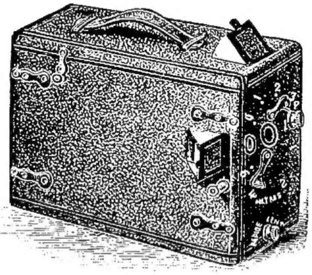

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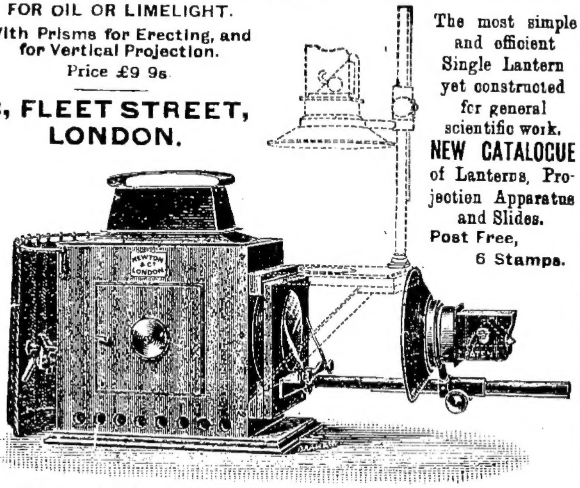

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